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(54) Abstract Title
Collapsible shelter for deployment from vehicle

(57) A collapsible shelter assembly (1) for deployment from a roof rack (R) on a vehicle (V) comprises a slidably mounted roof or floor panel carrying at least one wall panel (SP1, SP2, EP1, EP2, EP3) folded against one face thereof to form a substantially laminar slidable assembly, wherein in use, the substantially laminar slidable assembly is unfoldable to form a shelter after being slid out rearwardly from the roof rack. The slidable assembly is mounted on a slide mounting below the upper surface of the roof rack to enable goods to be carried normally on the roof rack. Because the assembly is only unfolded after being slid out, there is no interference between the assembly and the roof rack.

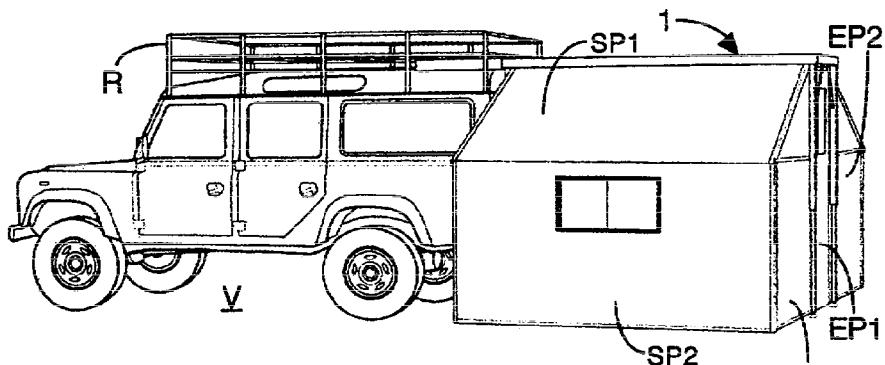


Figure 9

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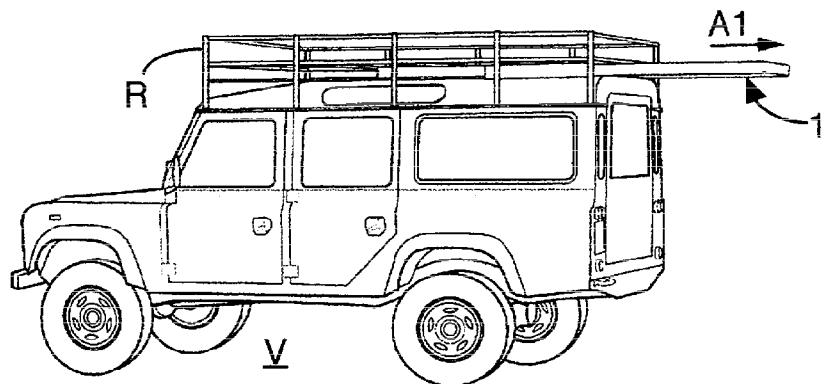


Figure 1

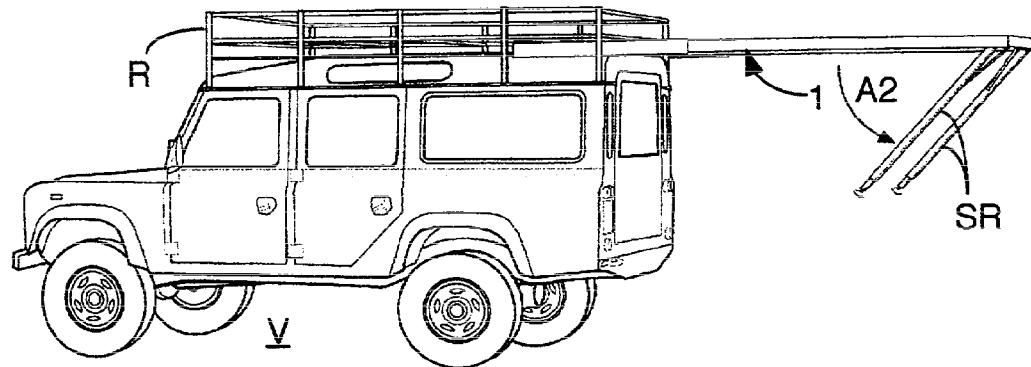


Figure 2

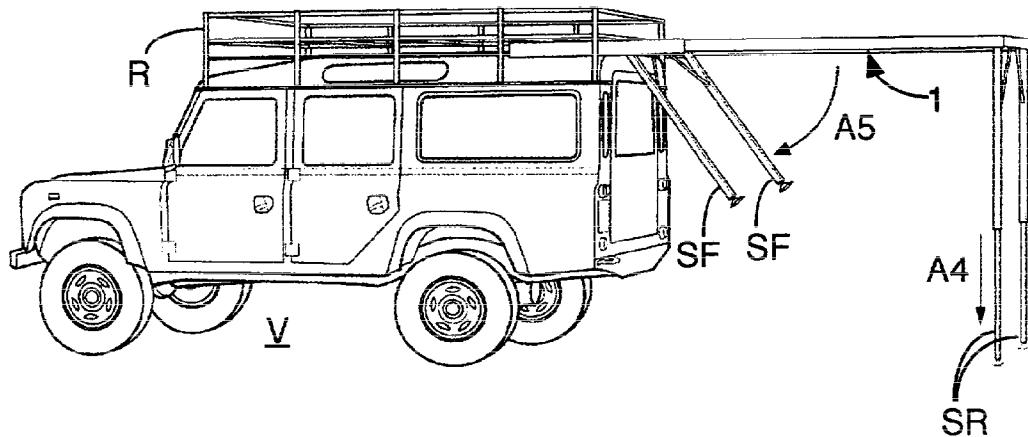


Figure 3

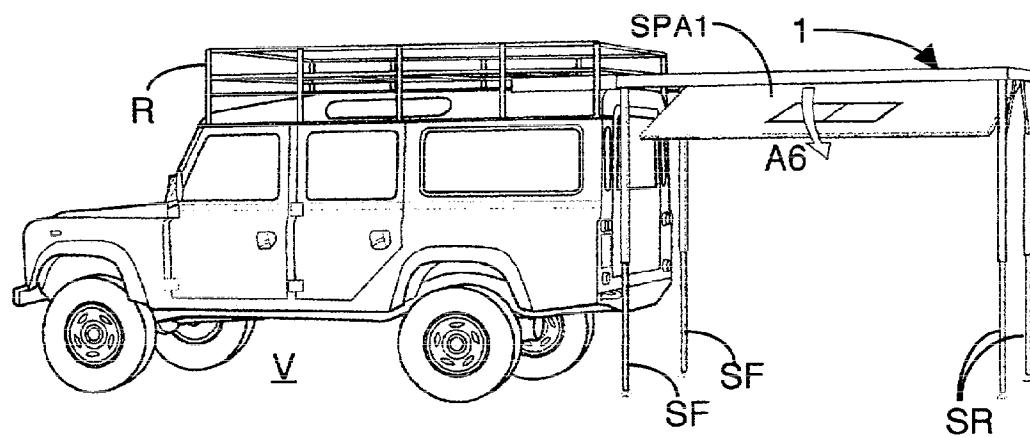


Figure 4

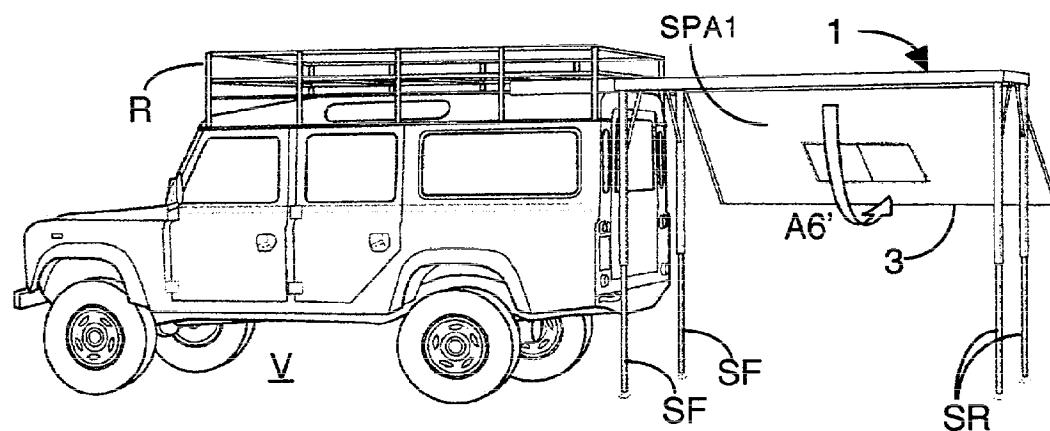


Figure 5

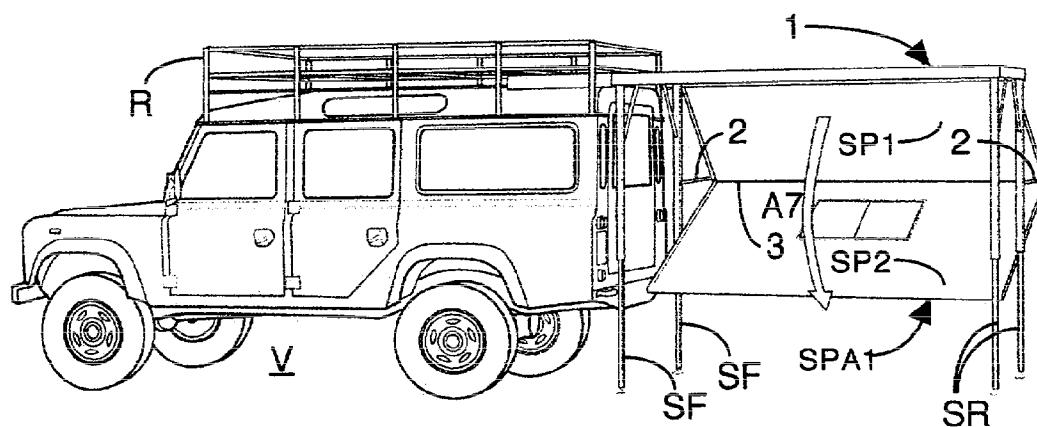


Figure 6

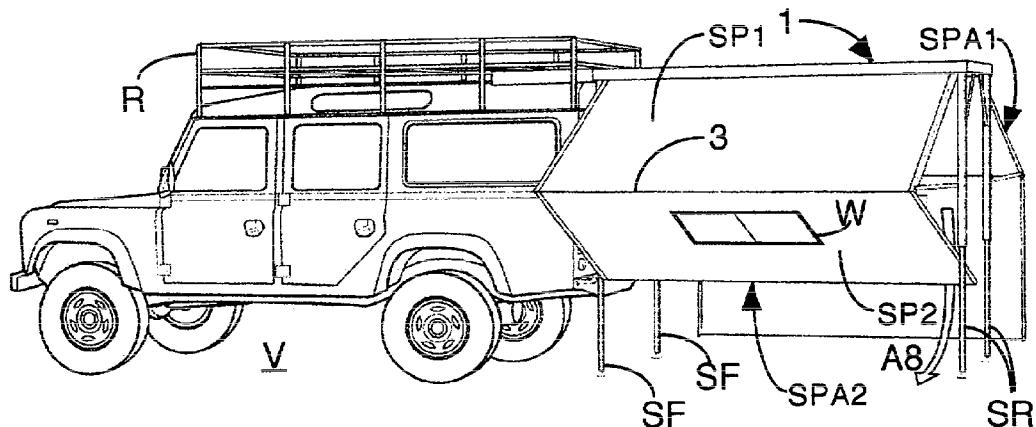


Figure 7

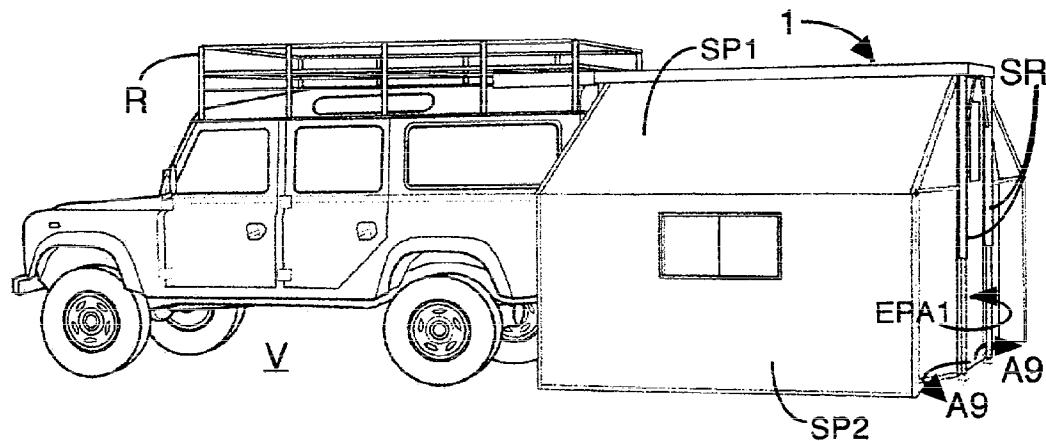


Figure 8

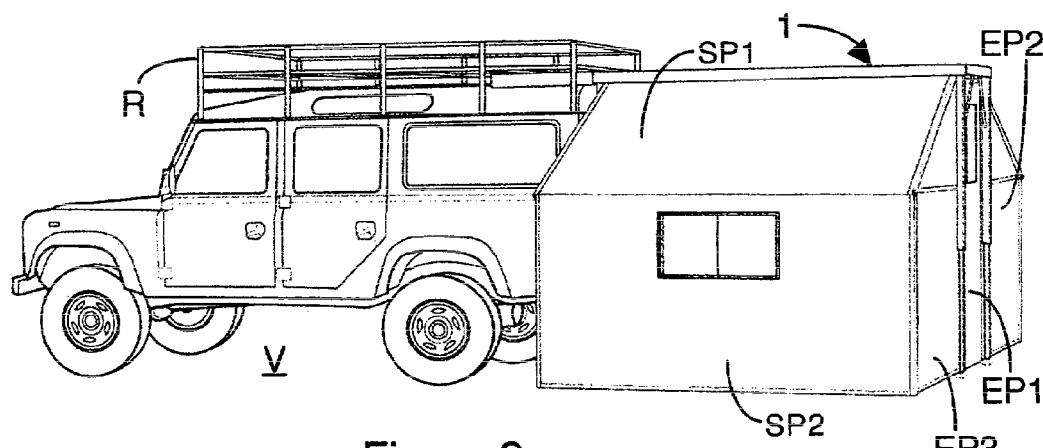


Figure 9

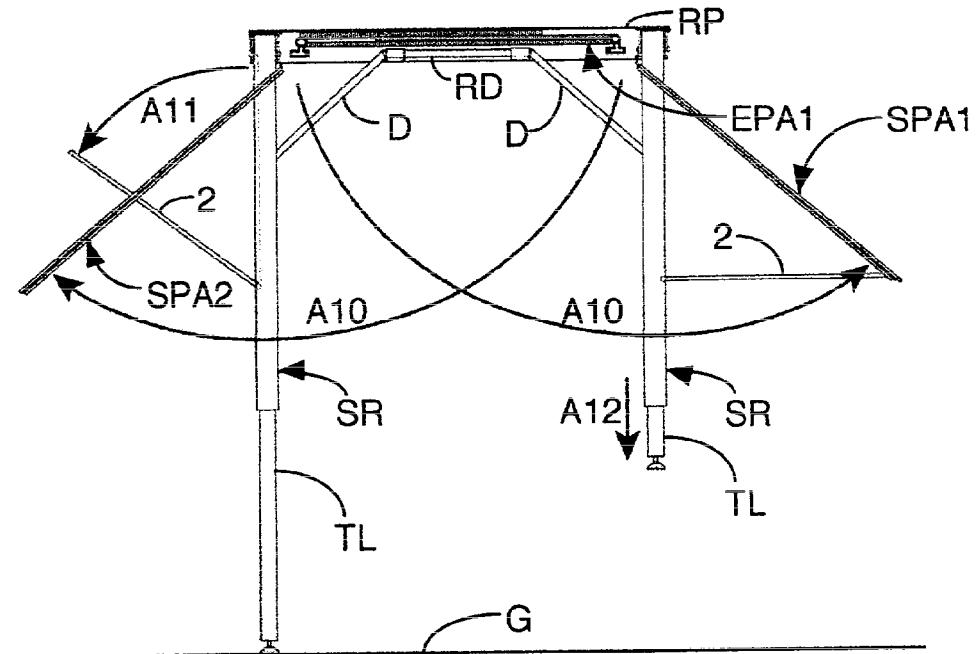
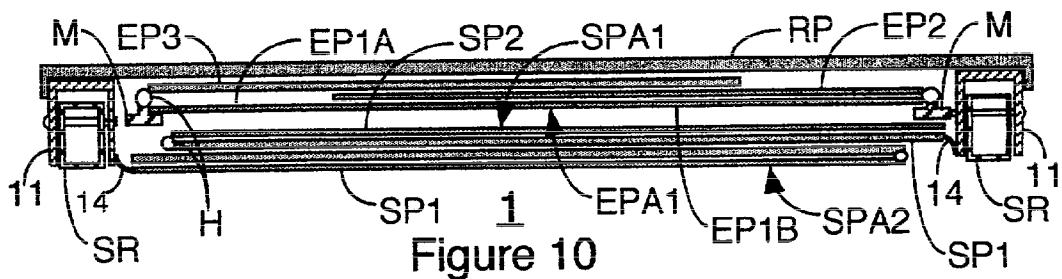


Figure 11A

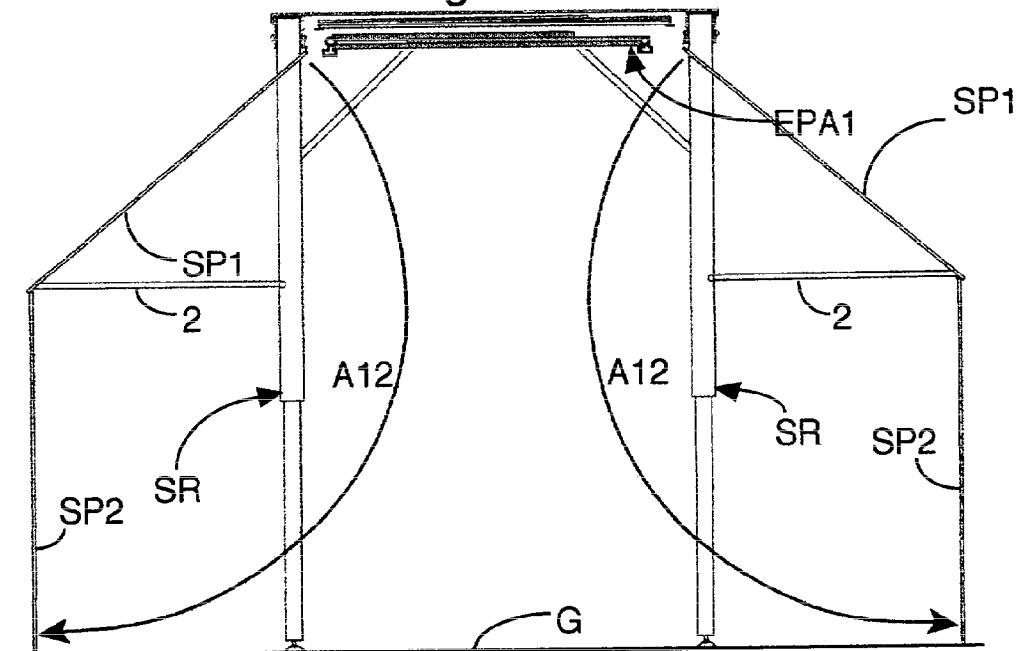


Figure 11B

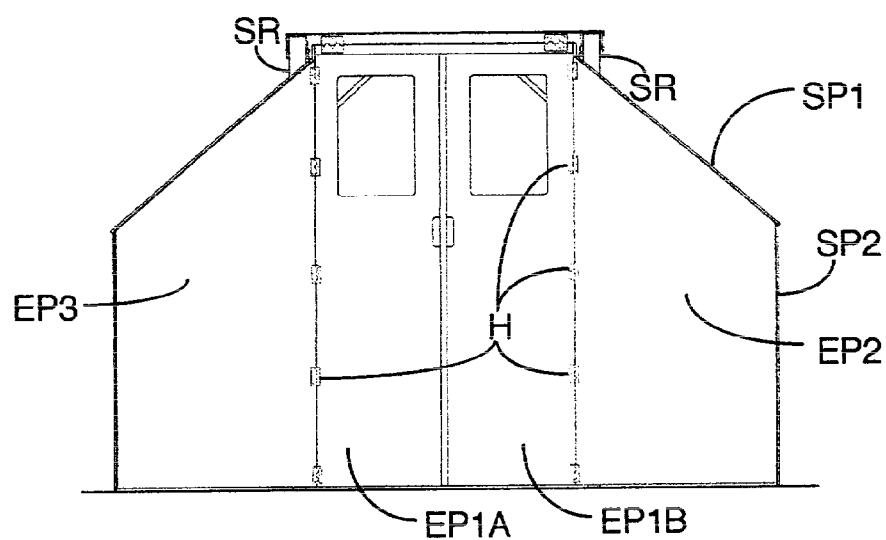


Figure 12

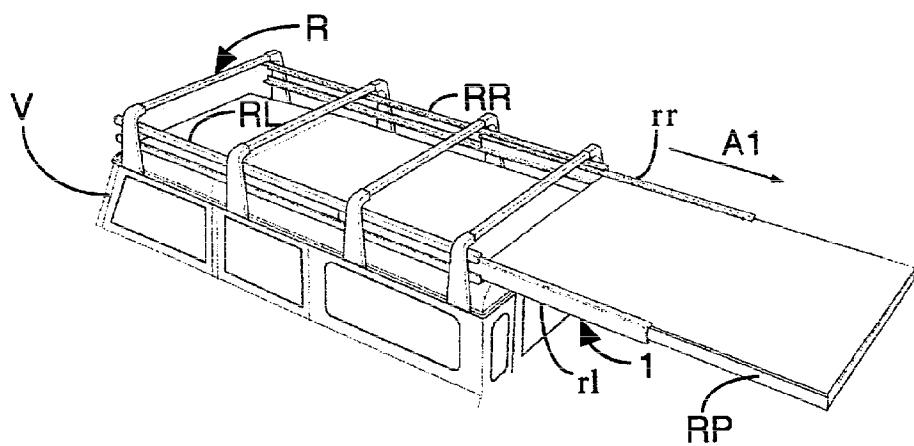
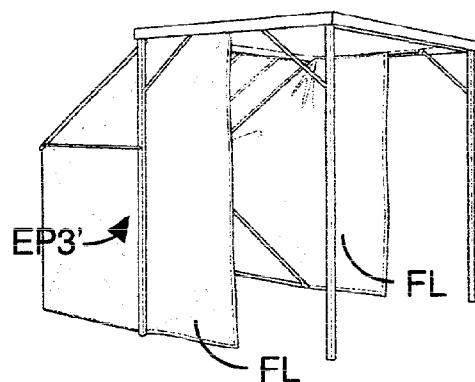
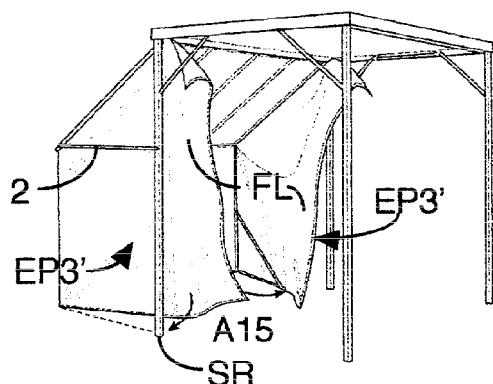
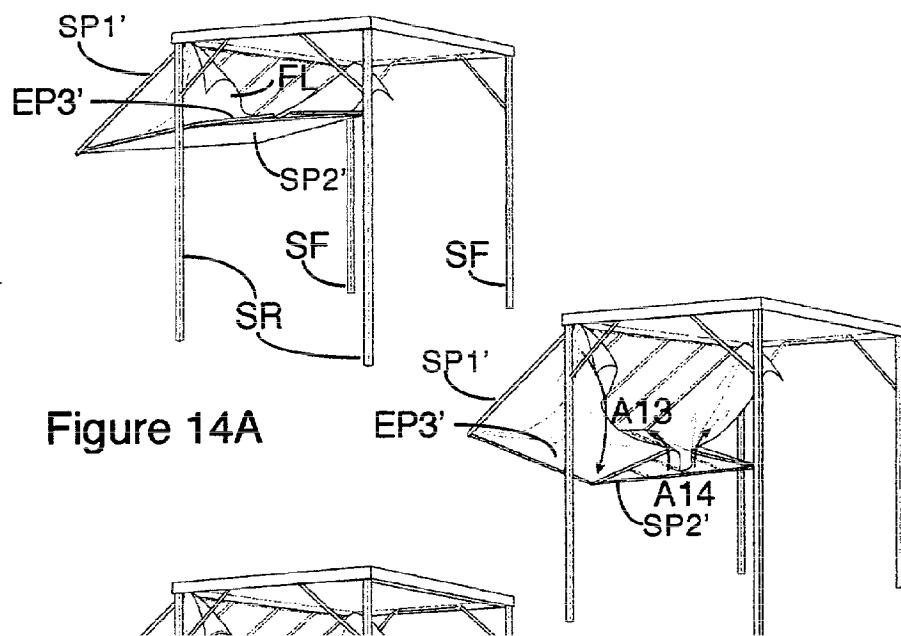


Figure 13



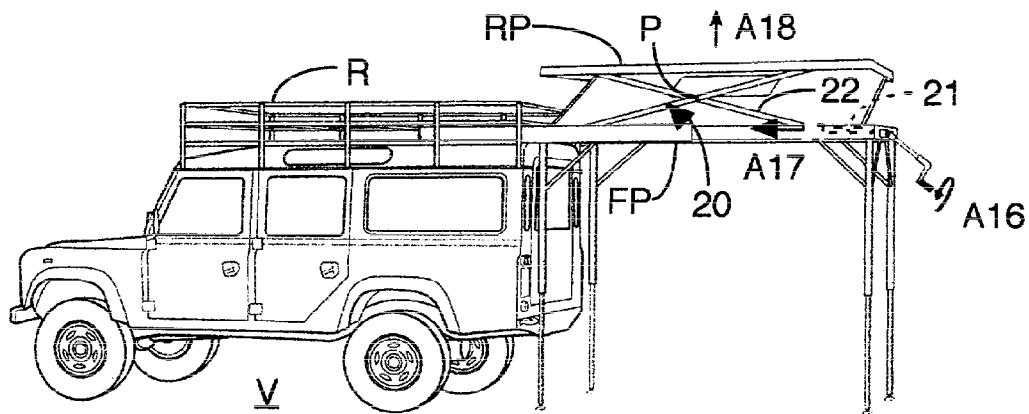


Figure 15A

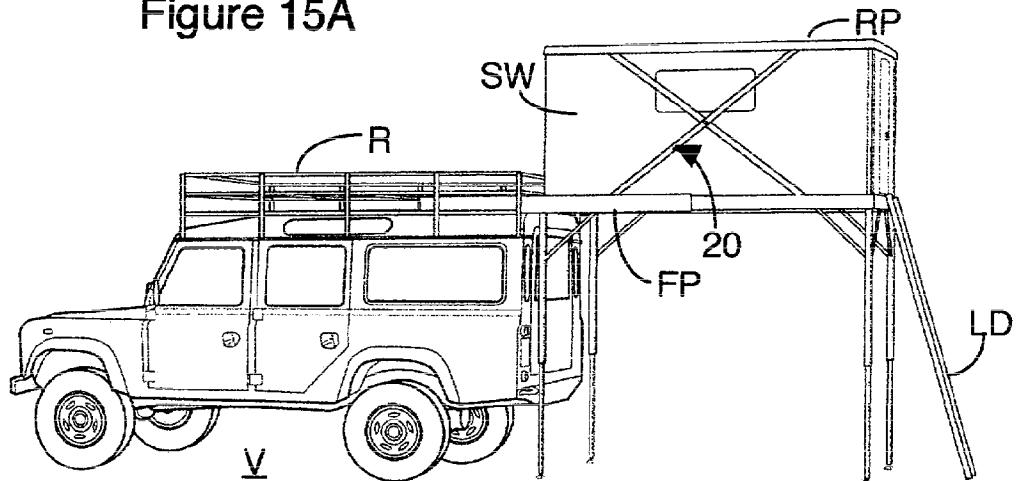


Figure 15B

Collapsible shelter

The present invention relates to collapsible shelters.

- 5 More particularly the invention relates to collapsible shelter assemblies for deployment from a vehicle mounting such as a roof rack for example. The invention also relates to collapsible shelter arrangements comprising a vehicle carrying a collapsible shelter assembly, eg on its roof rack.
- 10 Such shelter assemblies and arrangements are known; for example:

AU 609328 discloses a low-level trailer-mounted collapsible shelter arrangement.

- 15 IL 69841 and BR 6902183U both disclose shelter structures unfolding from the roof rack of a road vehicle. Thus IL 69841 discloses a base panel fixed to the vehicle roof and carrying a further unfolding base panel which is in turn hingedly connected to a ladder. BR 6902183U discloses a structure comprising a floor panel which similarly unfolds from a fixed floor panel on a roof rack.

- 20 However the above known arrangements all have the disadvantage of requiring a considerable amount of space for deployment from the vehicle. In particular the above roof-rack mounted shelters open upwardly from the top of a roof rack and hence either preclude the carrying of other items on top of the roof rack or require such items to be unloaded before the shelter can be unfolded.

- 25 An object of the present invention is to overcome or alleviate such disadvantages.

- Accordingly in one aspect the invention provides a collapsible shelter assembly for deployment from a vehicle mounting, the shelter assembly comprising a slidably mounted roof or floor panel carrying at least one wall panel folded against one face thereof to form a substantially laminar slidable assembly, wherein in use, the substantially laminar slidable assembly is unfoldable to form a shelter after being slid out from the vehicle mounting.

- 35 By first sliding out the substantially laminar assembly from the vehicle mounting (eg a roof rack) it is ensured that the further deployment of the shelter (typically by

unfolding) does not interfere with the vehicle or with any goods carried on it eg on the roof rack.

In a preferred embodiment the invention provides a collapsible shelter assembly for deployment from a roof rack, wherein the substantially laminar slidable assembly comprises at least one wall panel folded against the lower face of said slidably mounted panel. This feature ensures that the wall panel folds downwardly and outwardly away from the slidable panel during deployment of the shelter and thereby helps to protect the wall panel against damage eg from goods carried on the roof rack above the sliding panel.

Preferably the wall panel is a side panel and is arranged to unfold from said slidably mounted panel about an axis substantially parallel to the direction of sliding.

Preferably the slidably mounted roof or floor panel carries at least one strut folded against a face thereof, the strut being unfoldable to an upright condition on sliding out the substantially laminar assembly from the vehicle mounting.

Preferably the wall panel in turn carries a further wall panel folded against one face thereof. This feature enables the walls of the shelter to extend laterally from the roof panel andhence enables the area of the shelter to extend well beyond the area of the vehicle roof.

Further preferred features are defined in the dependent claims.

In another aspect the invention provides a collapsible shelter arrangement comprising a vehicle carrying a collapsible shelter assembly as defined above, the shelter assembly being deployable from a mounting on the vehicle.

Preferably the shelter assembly is deployable by sliding out from the underside of a roof rack on the vehicle.

Preferred embodiments of the invention are described below by way of example only with reference to Figures 1 to 15B of the accompanying drawings, wherein:

Figure 1 is a sketch perspective view showing the first stage in the deployment of a

collapsible shelter arrangement in accordance with the invention;

Figure 2 is a sketch perspective view showing the second stage in the deployment of the collapsible shelter arrangement;

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Figure 3 is a sketch perspective view showing further stages in the deployment of the collapsible shelter arrangement;

10 Figure 4 is a sketch perspective view showing the initial unfolding of the right-hand side panel assembly of the collapsible shelter arrangement;

Figure 5 is a sketch perspective view showing the further unfolding of the side panel assembly;

15 Figure 6 is a sketch perspective view showing the unfolding of the side panels of the above side panel assembly;

Figure 7 is a sketch perspective view showing the unfolding of left-hand side panel assembly of the collapsible shelter arrangement;

20

Figure 8 is a sketch perspective view showing the unfolding of an end panel assembly of the collapsible shelter arrangement;

Figure 9 shows the resulting erected shelter;

25

Figure 10 is a transverse cross-section showing the collapsible shelter assembly in its initial folded state when mounted on the roof rack;

30 Figure 11A is an end elevation (looking towards vehicle) of the collapsible shelter arrangement showing the extending of the rear struts and the unfolding of the side panel assemblies;

Figure 11B is an end elevation similar to Figure 11A showing the subsequent unfolding of the two side panels of each side panel assembly;

35

Figure 12 is an end elevation similar to Figures 11A and 11B showing the completed

structure with its end panel assembly;

Figure 13 is sketch perspective view from above showing the mounting arrangement of the collapsible shelter assembly on the roof rack of the vehicle;

5

Figure 14A is a sketch perspective view from the rear showing a variant of the collapsible shelter assembly of Figures 1 to 13 in which the separate end panel assembly is dispensed with and illustrating the initial unfolding of a modified side panel assembly;

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Figure 14B is a similar sketch perspective view from the rear showing a further stage in the unfolding of the modified side panel assembly;

15

Figure 14C is a similar sketch perspective view from the rear showing a further stage in the unfolding of the modified side panel assembly;

Figure 14D is a similar sketch perspective view from the rear showing the final stage in the unfolding of the modified side panel assembly;

20

Figure 15A is a sketch perspective view of a further embodiment in which the slidable panel functions as a floor panel, illustrating the initial erection of a further storey from the floor panel, and

25

Figure 15B is a similar sketch perspective view showing the completed structure of the above further embodiment.

Throughout the drawings, similar or identical parts in the different embodiments are indicated by the same reference numerals.

30

Referring to Figure 1, a road vehicle V is shown with a roof rack R. The latter includes a horizontal frame portion immediately above the roof of the vehicle and beneath the frame portion is mounted a substantially laminar collapsible shelter assembly 1 on a slide mounting (not shown) to enable it to be slid rearwardly in the direction of arrow A1 as shown. The top of the frame portion of the roof rack can be used for carrying luggage or other items in the normal fashion. The uppermost part of the laminar assembly is a roof panel and this carries the other components of the

35

assembly as will subsequently become apparent.

Referring to Figure 2, after fully extending the assembly 1, two rear struts SR, pivotally mounted from the rear corners of the roof panel and held horizontally in
5 the stowed condition, are swung downwardly and rearwardly as shown by arrow A2.

Referring to Figure 3, rear struts SR are then telescopically extended as shown by arrow A4 to reach ground level where they support the shelter. Two front struts SF, pivotally mounted from the front corners of the roof panel and held horizontally in
10 the stowed condition, are swung downwardly and forwardly as shown by arrow A5 and then telescopically extended as shown in Figure 4. A right-hand side panel assembly SPA1 which is hingedly mounted beneath the right-hand edge of the roof panel and in the stowed condition lies against the underside of the roof panel is then swung downwardly (as illustrated by arrow A6) and then out to the right (as
15 illustrated by arrow A6' in Figure 5).

As illustrated in Figures 5 and 6, side panel assembly SPA1 is hinged at 3 to form two panels SP1 and SP2 which in the stowed condition are folded against each other and, as illustrated in Figure 6, are unfolded as shown by arrow A7 until the latter
20 rests upright on the ground as shown in Figure 7. Figure 7 also shows a left-hand side panel assembly SPA2 being unfolded as shown by arrow A8 in a similar manner to the right-hand side panel assembly. Window portions W are formed in the side panels SP2.

25 The next stage in the erection of the shelter involves sliding an end panel assembly EPA1 rearwardly from beneath the roof panel. The end panel assembly comprises a central panel EP1 (Figure 9) which is hingedly connected at either side edge to right-hand and left-hand panels EP2 and EP3 which are unfolded from the upwardly/forwardly facing surface thereof as shown by arrows A9 (Figure 8) to join
30 the side panels SP1 and SP2 as shown in Figure 9. To this end, the panels EP2 and EP3 have a lower rectangular portion and an upper triangular portion, ensuring that the side wall panel assemblies SPA1 and SPA2 are complementary to the end wall panel assembly EPA1 such that they meet at common edge regions of the erected shelter.

35

This is illustrated further in Figure 12, which shows the end panel EP1 divided into

two halves EP1A and EP1B which form two leaves of a doorway and are hinged at hinges H to the panels EP2 and EP3. The latter panels mate with panels SP1 and SP2.

- 5 Finally, a further end wall panel assembly (not shown) which is similar to assembly EPA1 is similarly deployed from beneath the forward end of the roof panel to complete the shelter.

The substantially laminar slidable assembly is shown, somewhat diagrammatically,
10 in cross-section in the stowed condition in Figure 10. For the sake of clarity, the thickness (vertical dimension) of the assembly has been exaggerated. The total thickness of the laminar slidable assembly is approximately 80 to 90 mm. A roof panel RP is supported on a frame 11 of inverted channel section and the struts SR (and SF, not shown) are pivotally mounted within this frame.

- 15 Within the housing constituted by the roof panel RP and frame 11 are mounted two rubs M of inverted T section which carry hinge mountings for rear end panel assembly EPA1 (and also a similar front panel assembly, not shown, hidden by EPA1 in the drawing. The end panel assembly comprises an end panel formed of
20 two opening halves EPA1 and EPA2 which are hinged at H to further end panels EP2 and EP3, already referred to in connection with Figures 8 and 9.

Beneath the above end panel assemblies lies right-hand side panel assembly SPA1,
25 consisting of panel SP1 hingedly supported by a strip of flexible material 14 to the right-hand section of frame 11 and carrying a further panel SP2 connected to its left-hand edge by a hinge H. Beneath this side panel assembly lies the left-hand side panel assembly SPA2, similarly consisting of a panel SP1 hingedly supported by a strip of flexible material 14 to the left-hand section of frame 11 and carrying a further panel SP2 connected to its right-hand edge by a hinge H. The side panel assemblies can be supported away from the vehicle roof by eg a releasable catch (not shown).

- 30 The panels EP1, EP2 and EP3 and also the panels SP1 and SP2 are suitably of FELEXIGLAS (Registered Trade Mark) or MAKROLON (Registered Trade Mark)
35 polycarbonate and are approximately 10mm thick. However any suitable lightweight rigid or semi-rigid

material can be used.

- Referring to Figure 11A, arrows A10 show the side panel assemblies SPA1 and SPA2 being swung downwardly and outwardly during deployment and arrow A11 shows a left-hand strut 2, pivotally supported from mid-region of left-hand strut SR being swung from its stowed condition in which it lies against strut SR to a horizontal orientation (as shown for a similar right-hand strut 2) where it engages and supports the fold region of the side panel assembly. This Figure also shows the telescopic leg portions TL of the struts SR, one of which is being lowered as indicated by arrow A12 and the other of which has already extended to ground level G. Further rigidity is provided by diagonal struts D which are joined by a common horizontal rod portion RD which is pivotally supported from the rear of frame 11 to enable the free ends of the struts D to engage the struts SR.
- Figure 11B shows both struts 2 deployed to a horizontal orientation and the side panels SP2 swung out as indicated by arrows A12 to a vertical orientation in which their lower edges reach ground level G. At this stage the end panel assembly EPA1 remains stowed in the space beneath the roof panel.
- Figure 12 (previously referred to) shows the fully erected end panel assembly.

Figure 13 shows the slide mounting for the laminar assembly 1, comprising left-hand and right-hand slides RL and RR rigidly mounted on either side of the roof rack and accommodating left-hand and right-hand runners rl and rr which slide rearwardly as indicated by arrow A1. Within these runners rl and rr the roof panel and its associated frame 11 (Figure 10) is slidably mounted so that it too can slide in the direction of arrow A1.

- In the variant shown in Figures 14a to 14D, modified side panel assemblies comprising panels SP1' and SP2' are provided, each comprising a framework covered in flexible fabric (eg canvas). An end panel EP3' is hinged to the forward and rear edge of each panel SP2' and a flap FL of the fabric is tucked between panels SP1' and SP2' as shown in Figure 14A.
- As shown by arrow A13 in Figure 14B, panel SP2' is unfolded from panel SP1' and each end panel EP3' is unfolded from panel SP2' as indicated by arrows A14.

As indicated by arrow A15 in Figure 14C, the end panel EP3' is swung outwardly to meet rear struct SR. This leaves flaps FL at each end of the shelter (Figure 14D) which can be opened to provide access to the shelter.

5

In the variant shown in Figures 15A and 15B, the slidable panel forming the basis of the substantially laminar slidable assembly is a floor panel FP which is connected to a roof panel RP by a sidewall SW (Figure 15B) of flexible fabric. Roof panel RP is supported from the floor panel FP by scissor-action linkages 20 (only one of which 10 is visible in the drawing) on either side of the assembly.

As shown in Figure 15A, the lower end of a link 22 of the above linkage is slidably mounted in the frame surrounding panel FP and coupled to a worm drive arrangement 21 which is actuated by a crank at the rear of the assembly. On turning 15 the crank anticlockwise as shown by arrow 16 the bottom end of link 22 moves forwardly as shown by arrow A17 and raises roof panel RP as shown by arrow A18.

The fully erected shelter is shown in Figure 15B. A ladder LD is provided for access.

20 The features of the different embodiments can be combined; for example the shelter assembly of Figures 1 to 12 can be combined with the upper storey shown in Figures 15A and 15B.

25 In a further variant, the substantially laminar panel assembly could be arranged to slide forwardly over the bonnet of the vehicle rather than rearwardly, enabling the shelter to be erected over the bonnet eg to provide shelter during repair or maintenance of the engine.

30 In a further variant the substantially laminar panel assembly could be arranged to slide laterally to one side of the vehicle.

Claims

1. A collapsible shelter assembly for deployment from a vehicle mounting, the shelter assembly comprising a slidably mounted roof or floor panel carrying at least one wall panel folded against one face thereof to form a substantially laminar slidable assembly, wherein in use, the substantially laminar slidable assembly is unfoldable to form a shelter after being slid out from the vehicle mounting.
5
2. A collapsible shelter assembly according to claim 1 for deployment from a roof rack, wherein the substantially laminar slidable assembly comprises at least one wall panel folded against the lower face of said slidably mounted panel.
10
3. A collapsible shelter assembly according to claim 1 or claim 2 wherein said wall panel is a side panel and is arranged to unfold from said slidably mounted panel about an axis substantially parallel to the direction of sliding.
15
4. A collapsible shelter assembly according to any preceding claim wherein the slidably mounted roof or floor panel carries at least one strut folded against a face thereof, the strut being unfoldable to an upright condition on sliding out the substantially laminar assembly from the vehicle mounting.
20
5. A collapsible shelter assembly according to claim 4 wherein at least one strut folded against said face is pivotally connected to the slidable roof or floor panel adjacent a distal end of the slidable roof or floor panel.
25
6. A collapsible shelter assembly according to claim 4 or claim 5 comprising two such struts.
7. A collapsible shelter assembly according to any of claims 4 to 6 comprising at least one forward strut folded against a face of the slidably mounted roof or floor panel and at least one rear strut folded against said face of the slidably mounted roof or floor panel, the forward and rear struts extending towards each other.
30
8. A collapsible shelter assembly according to any of claims 4 to 7 wherein the substantially laminar slidable assembly comprises a frame extending around the periphery of the slidably mounted roof or floor panel and the or each strut is
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pivottally mounted on the frame.

9. A collapsible shelter assembly according to any preceding claim wherein the wall panel in turn carries a further wall panel folded against one face thereof.

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10. A collapsible shelter assembly according to any preceding claim wherein the slidably mounted floor or roof panel carries a wall panel assembly slidably mounted against one face thereof, the slidably mounted panel assembly being slidably demountable from the slidably mounted floor or roof panel.

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11. A collapsible shelter assembly according to claim 10 wherein said slidably mounted wall panel assembly is an end panel assembly slideable in the same direction as the slidably mounted floor or roof panel.

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12. A collapsible shelter assembly according to claim 10 or claim 11 wherein said slidably mounted wall panel assembly comprises a slidably mounted wall panel carrying at least one further wall panel folded against one face thereof.

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13. A collapsible shelter assembly according to claim 12 as dependent upon claim 9 wherein the first and second-mentioned wall panel assemblies are complementary to each other such that they meet at a common edge region of the erected shelter.

14. A collapsible shelter assembly according to any preceding claim wherein the panels are composed of rigid or semi-rigid material.

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15. A collapsible shelter assembly according to claim 14 wherein the panels are composed of polycarbonate material.

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16. A collapsible shelter assembly according to any preceding claim wherein the substantially laminar slidable assembly comprises a floor panel and a roof panel and drive means for raising the roof panel from the floor panel after sliding out the substantially laminar assembly.

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17. A collapsible shelter assembly according to claim 16 wherein the respective preipheries of the floor panel and roof panel are joined by a sheet of flexible material which in use forms a wall of the shelter assembly.

18. A collapsible shelter assembly according to claim 16 or claim 17 wherein the drive means comprises a scissor-action linkage.
19. A collapsible shelter assembly substantially as described hereinabove with reference to Figures 1 to 13 optionally as modified in accordance with Figures 14A to 14D or Figures 15A and 15B of the accompanying drawings.
20. A collapsible shelter arrangement comprising a vehicle carrying a collapsible shelter assembly as claimed in any preceding claim, the shelter assembly being deployable from a mounting on the vehicle.
21. A collapsible shelter arrangement according to claim 20 wherein the shelter assembly is deployable by sliding out from the underside of a roof rack on the vehicle.
22. A collapsible shelter arrangement comprising a vehicle carrying a collapsible shelter assembly, the arrangement being substantially as described hereinabove with reference to Figures 1 to 13 optionally as modified in accordance with Figures 14A to 14D or Figures 15A and 15B of the accompanying drawings.

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Application No: GB 0011569.1
Claims searched: 1 - 22

Examiner: J D Cantrell
Date of search: 21 May 2001

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK Cl (Ed.S): E1D: DTEB DF196
Int Cl (Ed.7): E04H
Other: ON - LINE : EPODOC, PAJ, WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 735367 BRINCK	1,2,9,14,20

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.